

## REMARKS/ARGUMENTS

This is a preliminary amendment in a RCE application. The Office Action mailed November 23, 2007 has been carefully reviewed. Reconsideration of this application is respectfully requested. The original application contained claims 1-59. Claims 1-55 are withdrawn from consideration. Claim 59 has been cancelled. The claims presented for examination are: claims 56-58.

Applicant's Claimed Invention

The terrorist acts on September 11 have raised questions about the vulnerability of our water systems to deliberate attacks. U.S. law enforcement and intelligence agencies have received indications that Al-Qa'ida members have sought information on US water supply and wastewater systems. In addition, our water systems are aging which introduces vulnerability. The infrastructure and protection of water systems need to be considered in a new light. Safeguarding water supplies from sabotage requires engineering analysis and problem-solving, scientific advances, and evaluation of institutional arrangements and water policies. Appellants' invention is illustrated in FIG. 1 below.

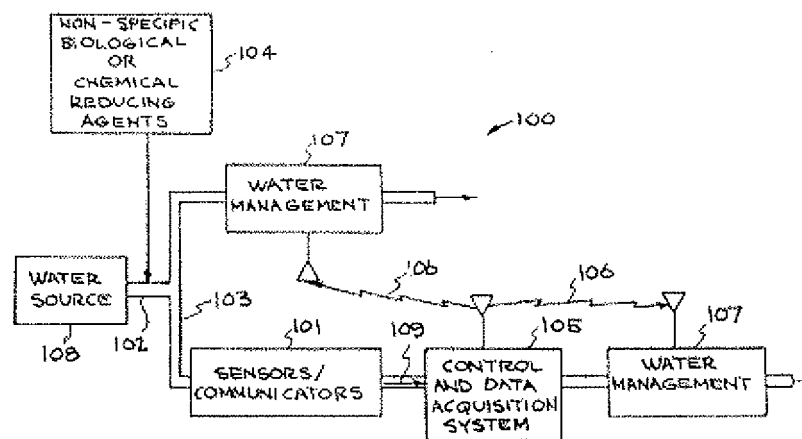


FIG. 1

The system 100 is particularly useful for providing early warning of contamination in large urban areas where a typical municipal water distribution system will deliver water at a rate of 50 gal/day per capita to 350,000 individuals. The system 100 can be installed in existing pipes through standard procedures. The system 100 is low in cost.

The system 100 includes an array of autonomous sensors/communicators 101 that are exposed to the water flow 102, from a water source 108, in pipes 103, comprising the treated (e.g., chlorinated, filtered) water municipal distribution system. The array of autonomous sensors 101 detects the loss of chlorination shield upon introduction of non-specific biological or chemical reducing agents 104 into the water 102. Each sensor communicates by emitting acoustic signal burst 109, using the pipes 103 as wave-guides or channels. The preexisting Supervisory Control and Data Acquisition Systems (SCADAS) 105 receive the signal 109 and communicate by radio 106 to water management 107.

The sensors 101 communicate by emitting acoustic signal bursts 109, using the pipes 103 as wave-guides or channels. The Supervisory Control and Data Acquisition Systems (SCADAS) 105 receives the signal 109 and communicate by radio 106 to water management 107.

In addition to the oxidation potential and pH sensing, the system 100 has applicability and use for: elemental chlorine, chloramines, oxidative oxy-halogen compounds, ozone, oxygen, peroxydisulfate, peroxymonosulfate; strong reducing agents including hyposulfite, thiosulfate, ferrocyanide, sulfide,  $H_2S$ ; and specific ions and solid/liquid dispersions of cyanide, selenium, lead, mercury and arsenic containing compounds; specific nerve and blistering agents including but not necessarily limited to VX, Lewisite, G-agents, phosgene, and mustard gases; and radiological sources including actinides and radioactive isotopes of iodine, cesium, strontium, thorium and cobalt. The sensors 101 may

include specific sensors for biological materials, biochemicals or live, dead or sporulated bacteriological, viral or microbial organisms.

### **35 U.S.C. § 103 Rejection – Fukunaga In View of Havlena**

In numbered paragraph 5 of the Office Action mailed November 23, 2007 claims 56-58 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,290,908 to Fukunaga et al (hereinafter "Fukunaga") in view of Havlena (U.S. 2002/0189362).

### **Fukunaga Reference**

The Fukunaga reference discloses a water quality meter composed of a plurality of analyzing units for analyzing water samples introduced from a water distribution pipe, each analyzing unit including a reagent mixing cell and a measuring cell, and a liquid introducing unit integrated with the analyzing units, which is composed of a single member in which a plurality of fluid flow paths for feeding various types of liquid including the water sample into the analyzing unit are formed. The Fukunaga reference method is illustrated in FIG. 3 and the portions of the Fukunaga specification reproduced below.

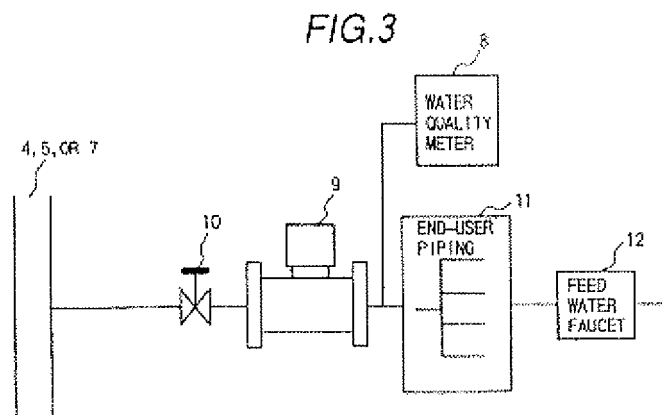


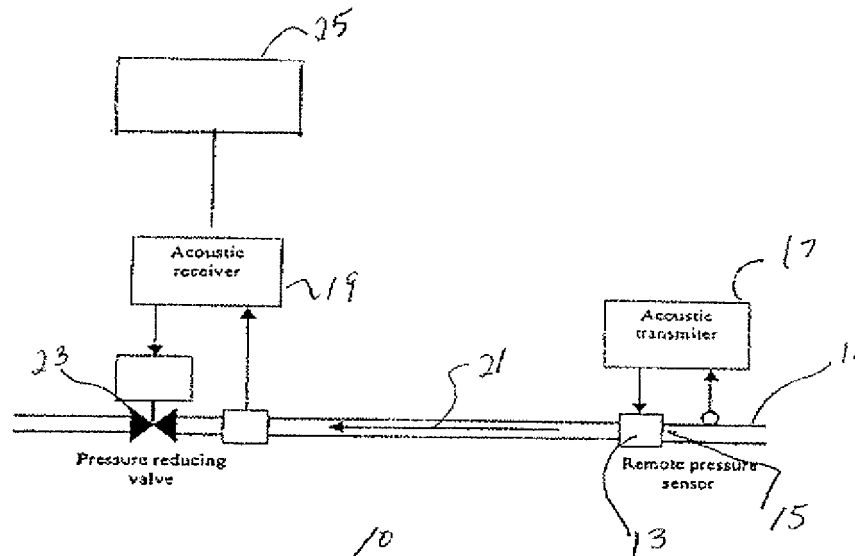
FIG. 3 shows an example of a method of setting a water quality meter at an end user side in a water quality monitoring system of an embodiment according to the present invention. The distributed drinking water branched from the water distribution subsystem main pipe 5 on the water supplier side, the water supplier side sub-pipe 6, or the end-user side pipe 7, enters the end-user piping 11 via a shut off valve 10 and a water meter 9, and a

plurality of measurement categories for the quality of the drinking water is simultaneously measured by the water quality meter 8. The end-user piping is a network system composed of pipes, and some of the drinking water is fed to an end user from a location on the end user piping 11 via a feed water faucet 12 such as a water tap faucet. The water quality meter 8 can be attached before or after the water meter 9, or in a water meter container box, and further has a size such that it can be easily set in a manhole, a fire hydrant, a utility in the house of an end user, or in the vicinity of a water tap faucet. Although the composition of the water quality meter 8 is later explained in detail, in accordance with the embodiment of the present invention, the water quality meter 8 can be easily set in a space of 10 cm×20 cm×20 cm.

### **Havlena Reference**

The abstract of the Havlena reference states: "A system for monitoring the flow of a fluid such as water in a pipe, including a remote pressure sensor operably connected to the pipe for sensing the pressure of the fluid at the location of the pressure sensor. An acoustic transmitter is placed proximate the remote pressure sensor for transmitting the output of the sensors by an acoustic signal transmitted through the fluid in the pipe to an acoustic receiver that generates a control signal in response thereto control a pressure control valve for adjusting the pressure in the pipe in response. The system is intended for a water distribution networks that include a plurality of pipes, with a remote pressure sensor, transmitter, receiver and control device for at least some of the plurality of pipes."

The Havlena reference "provides a system in which the outlet pressure of a pressure reducing valve in a fluid flow system is controlled by a master controller based on direct measurement of pressure at various places in the system to provide the desired pressure at those various places in the system."



As shown in the FIGURE, the system, 10 generally, comprises a plurality of pipes 11, with one pipe 11 shown for simplicity. A pressure sensor 13 measures the pressure at a specific location 15, and generates a signal in response to that pressure to an acoustic transmitter 17. Transmitter 17 then transmits an acoustic signal along pipe 11 to an acoustic receiver 19, which in turn converts the sound wave into information about the remote pressure 21 that is used by the master pressure controller 25 to define the setpoint for the slave controller that controls the pressure reducing valve 23.

Internally, the pressure controller receives the measured, compares with setpoint for the remote pressure, and defines the outlet pressure for the pressure reducing valve 23 to reduce the difference between the measured pressure and its set point. The slave controller compares the measured outlet pressure at the pressure reduce valve 23 outlet with the set point and open/close the valve to follow this set point. The internal operation is a standard cascade connection of master and slave controllers and is available from a plurality of manufacturers.

The pressure reducing valve 23 is continuously adjusted by the controller and its outlet pressure set point is modified every time a signal is sent along pipe 11 by transmitter 17, so that the only time lag between control and change in pressure, for example by change in demand for the use of the water at that location, is the speed of sound, i.e., the acoustic signal speed, in water or whatever the fluid medium is that is being monitored.

#### **Prima Facie Case of Obviousness Can Not Been Established**

The rejection of claims 56-58 under 35 U.S.C. § 103(a) is respectfully traversed. Claims 56-58 have been amended. It would not be possible to establish a "Prima Facie Case of Obviousness" against Applicant's amended claims 56-58

by combining Fukunaga and Havlena. The initial burden of factually supporting a *prima facie* conclusion of obviousness (M.P.E.P. Section 2142) could not be not been met. Three basic criteria are required to establish a *prima facie* case of obviousness.

The prior art reference (or reference when combined) must teach or suggest all the claim limitations.

The Examiner must provide reasons for combining the references (Examination Guidelines for Determining Obviousness in Light of the Supreme Court's KSR v. Teleflex Decision).

There must be a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

#### **References Do Not Teach Claim Limitations**

The Fukunaga and Havlena references do not disclose many of Applicant's claim limitations. One criteria of the Examiner's initial burden of factually supporting a *prima facie* conclusion of obviousness is: the prior art reference (or reference when combined) must teach or suggest all the claim limitations. In assessing any *prima facie* conclusion of obviousness the guidance of the Supreme Court in *Graham v. John Deere Co.* is used. *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966) requires determining: the scope and content of the prior art and ascertaining the differences between the prior art and the claims at issue. The Fukunaga and Havlena references do not disclose the following claim limitations of Applicant's claims:

"A method of providing early warning of contamination of water in a municipal water distribution system having existing pipes by detecting chemical or biological agent contaminates introduced into the water in the existing pipes of the municipal water distribution system wherein the

existing pipes are an existing water filled pipe or existing water filled pipes extending from a water source and wherein the municipal water system includes a supervisory control and data acquisition system and a water management system, comprising the steps of:"

"producing an acoustic signal in the water in the existing water filled pipe or water filled pipes upon the sensing of the chemical or biological agent contaminates that have been introduced into the water,"

"using the existing water filled pipe or water filled pipes as wave-guides or channels for transmitting said acoustic signal,"

"receiving said acoustic signal in the existing water filled pipe or water filled pipes wherein said acoustic signal has been transmitted using the existing water filled pipe or water filled pipes as wave-guides or channels,"

"signaling the supervisory control and data acquisition system and the water management system upon receiving said acoustic signal indicating said sensing of the chemical or biological agent contaminates that have been introduced into the water,"

"wherein said step of sensing the chemical or biological agent contaminates that have been introduced into the water comprises sensing biochemicals or elemental chlorine or oxidative oxy-halogen compounds or ozone or oxygen or peroxydisulfate or strong reducing agents or hyposulfite or thiosulfate or sulfide or H<sub>2</sub>S or cyanide or selenium or lead sensor or mercury or arsenic or nerve agents or blistering or VX or Lewisite or G-agents or phosgene or gas or actinides or radioactive isotopes or radioactive iodine or radioactive cesium or radioactive strontium sensor or thorium or radioactive cobalt or radioactive thorium chemical contaminates that have been introduced into the water,"

"wherein said step of sensing the chemical or biological agent contaminates that have been introduced into the water comprises sensing sporulated bacteria or viral organisms or microbial organisms biological contaminates that have been introduced into the water."

Since the limitations listed and described above are not shown by Fukunaga or Havlena, a *prima facie* case of obviousness can not be established. Further, since Fukunaga and Havlena fail to show the claim limitations of Applicant's claims there can be no combination of the two references that would

show Appellant's invention. There is no combination of Fukunaga and Havlena that would produce the combination of elements of Applicant's amended claims 56-58. Thus, the combination of references in the Final Rejection mailed November 23, 2007 fails to support a rejection of amended claims 56-58 under 35 U.S.C. § 103(a), and the rejection should be reversed.

**No Reason for Combining Fukunaga and Havlena**

Another criterion of the Examiner's initial burden of factually supporting a *prima facie* conclusion of obviousness is: the Examiner must provide reasons for combining the references (Examination Guidelines for Determining Obviousness in Light of the Supreme Court's KSR v. Teleflex Decision). The Final Rejection mailed November 23, 2007 does not provide an explanation of how or why the Fukunaga reference and the Havlena reference would or could be combined.

The Fukunaga reference and the Havlena reference fail to recognize the problem solved by Applicant's invention of amended claim 56-58; therefore, it would not be obvious to combine the Fukunaga reference and the Havlena reference to produce Applicant's invention of amended claim 56-58. The Fukunaga reference and the Havlena reference do not recognize the problem of quickly, efficiently, and inexpensively providing a method of providing early warning of contamination of water in a municipal water distribution system having existing pipes by detecting chemical or biological agent contaminants introduced into the water in the existing pipes.

Thus, the combination of references in the Office Action mailed November 23, 2007 fails to support a rejection of claims 1-24 under 35 U.S.C. § 103(a), and the rejection should be reversed.

**No Reasonable Expectation of Success With the Proposed Combination**

The criteria that "There must be a reasonable expectation of success" in combining the Fukunaga and Havlena references has not been established.

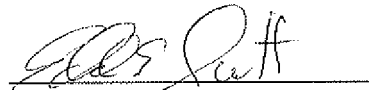


The proposed combining of the Fukunaga and Havlena references would not produce a method providing early warning of contamination of water in a municipal water distribution system having existing pipes. The Havlena reference only measures pressure and generates a control signal in response thereto control a pressure control valve for adjusting the pressure in the pipe and does not disclose a method providing early warning of contamination of water in a municipal water distribution system having existing pipes. There would not be a reasonable expectation of success in combining the Fukunaga reference and the Havlena et al reference. The rejection should be reversed.

**SUMMARY**

The undersigned respectfully submits that, in view of the foregoing amendments and the foregoing remarks, the rejections of the claims raised in the Office Action dated November 23, 2007 have been fully addressed and overcome, and the present application is believed to be in condition for allowance. It is respectfully requested that this application be reconsidered, that the claims be allowed, and that this case be passed to issue. If it is believed that a telephone conversation would expedite the prosecution of the present application, or clarify matters with regard to its allowance, the Examiner is invited to call the undersigned attorney at (925) 424-6897.

Respectfully submitted,



Eddie E. Scott

Attorney for Applicant

Registration No. 25,220

Tel. No. (925) 424-6897

Livermore, California

Dated: 3/17/2008